

Direct MethodLinear :-

$$y = a_0 + a_1 x$$

Quadratic :-

$$y = a_0 + a_1 x + a_2 x^2$$

Cubic :-

$$y = a_0 + a_1 x + a_2 x^2 + a_3 x^3$$

Newton Divided DifferenceLinear :-

$$f(x) = b_0 + b_1(x - x_0)$$

Quadratic :-

$$f(x) = b_0 + b_1(x - x_0) + b_2(x - x_0)(x - x_1)$$

Cubic :-

$$f(x) = b_0 + b_1(x - x_0) + b_2(x - x_0)(x - x_1) + b_3(x - x_0)(x - x_1)(x - x_2)$$

$$b_0 = f(x_0)$$

$$b_1 = f(x_0, x_1) = \frac{f(x_1) - f(x_0)}{x_1 - x_0}$$

$$b_2 = f(x_0, x_1, x_2) = \frac{f(x_1, x_2) - f(x_0, x_1)}{x_2 - x_0}$$

Lagrange MethodLinear:-

$$V(t) = \left(\frac{t - t_1}{t_0 - t_1} \right) V(t_0) + \left(\frac{t - t_0}{t_1 - t_0} \right) V(t_1)$$

Quadratic:-

$$V(t) = \left(\frac{t - t_1}{t_0 - t_1} \right) \left(\frac{t - t_2}{t_0 - t_2} \right) V(t_0) + \left(\frac{t - t_0}{t_1 - t_0} \right) \left(\frac{t - t_2}{t_1 - t_2} \right) V(t_1) \\ + \left(\frac{t - t_0}{t_2 - t_0} \right) \left(\frac{t - t_1}{t_2 - t_1} \right) V(t_2)$$

Cubic

$$V(t) = \left(\frac{t - t_1}{t_0 - t_1} \right) \left(\frac{t - t_2}{t_0 - t_2} \right) \left(\frac{t - t_3}{t_0 - t_3} \right) V(t_0) \\ + \left(\frac{t - t_0}{t_1 - t_0} \right) \left(\frac{t - t_2}{t_1 - t_2} \right) \left(\frac{t - t_3}{t_1 - t_3} \right) V(t_1) \\ + \left(\frac{t - t_0}{t_2 - t_0} \right) \left(\frac{t - t_1}{t_2 - t_1} \right) \left(\frac{t - t_3}{t_2 - t_3} \right) V(t_2) \\ + \left(\frac{t - t_0}{t_3 - t_0} \right) \left(\frac{t - t_1}{t_3 - t_1} \right) \left(\frac{t - t_2}{t_3 - t_2} \right) V(t_3)$$